SALIX SCOULERIANA (SALICACEAE) DISCOVERED IN MEXICO

George W. Argus
National Museum of Natural Sciences,
Ottawa, K1A 0M8, Canada

Abstract

The boreal species *Salix scouleriana* has been found to occur in Mexico. A study of the type material of *Salix pattersonii* and *S. wendtii* revealed that both are *S. scouleriana*. The original identification of *S. wendtii* as new was due, in part, to a misunderstanding of the change that occurs in ament morphology when a plant flowers twice in the same year.

Resumen

La especie boreal *Salix scouleriana* se ha encontrado en México. Un estudio de *Salix pattersonii* y de *S. wendtii* ha descubierto que ambas especies son *S. scouleriana*. La identificación original de *S. wendtii* como especie nueva se debe, en parte, a un mal entendimiento del cambio que ocurre en la morfología del amento cuando una planta produce sus flores dos veces durante el mismo año.

The genus *Salix* is less well known in Mexico than it is in other parts of North America. Since C. Schneider's 1918 conspectus of the genus in Mexico, West Indies, and Central and South America only five papers on the genus in this region are known to me (Standley 1920, Johnston 1944, Espinosa 1979, Johnston 1981, Nee 1984). In the southwestern United States there are about eight willows of arctic-alpine (*S. arctica* Pall., *S. brachycarpa* Nutt., *S. glauca* L., *S. reticulata* ssp. *nivalis* (Hook.) A. Löve, D. Löve & Kapoor) or boreal (*S. bebbiana* Sarg., *S. drummondiana* J. Barratt ex Hook., *S. planifolia* Pursh, *S. scouleriana* J. Barratt ex Hook.) affinities that occur at relatively high elevations. None of these species have been reported to occur in Mexico, although suitable habitats, at least for some of the boreal species, are to be found there. It did not come as a complete surprise, therefore, to find one of them present in Mexico under a different name.

In the course of studying the holotypes of two Mexican *Salix, S. pattersonii* M. C. Johnston and *S. wendtii* M. C. Johnston, I discovered that both are the widespread boreal species *S. scouleriana*, a species not previously known to occur in Mexico. Both of Johnston's new species, which were described in 1981, were based on single collections: *S. pattersonii* on *Riskind and Patterson 1809* (LL) and *S. wendtii* on *Wendt and Adamcewicz 518* (TEX). In addition

Madroño, Vol. 35, No. 4, pp. 350–352, 1988

to the holotypes two specimens tentatively identified as *S. pattersonii,* namely, *Wendt 124a* (TEX), and *Riskind et al. 1720* (LL) and two specimens listed as "*Salix* sp. nov.?", *Wendt and Lott P29* (CAN, TEX) and *Mueller 3242* (LL), have also been identified here as *S. scouleriana.*

The Mexican specimens have the following characteristics that are typical of *S. scouleriana* (Argus 1973): (1) Large floral winter buds; (2) leaves with two kinds of indumentum, (a) leaves sparsely pubescent beneath with a mixture of white and ferruginous hairs, and (b) leaves densely tomentose beneath with white hairs, but with a few ferruginous hairs on the upper surface; (3) aments usually sessile, or borne on a short spur shoot and usually flowering precociously (see below); (4) pistils sericeous with a mixture of ferruginous and white hairs; (5) pistils borne on long stipes (1.2–2.4 mm); and (6) black or dark brown floral bracts.

The holotype of *S. wendtii* is an apparent exception to character (3) in that its aments are borne on long, leafy shoots and are flowering in early August. Precocious species flower before the leaves appear and have sessile aments, whereas coetaneous and serotinous species flower with or after leaf emergence and have aments borne on prominent leafy spur shoots. This distinction between precocious and coetaneous and serotinous species is usually given high taxonomic value in the identification of *Salix.* The presence of an exceptionally long spur shoot in this holotype is most likely what directed Johnston's attention away from *S. scouleriana* or any of the other precociously flowering species. A close examination, however, reveals that the aments on this plant emerged from buds formed that year and therefore represent a second flowering. In some precociously flowering species aments that emerge from buds in the same year in which they were formed are borne on long, leafy shoots rather than being sessile. This condition was observed previously in *S. planifolia* in northern Saskatchewan (Argus 1979). In that particular case, as well, the plants were described as a new species, *S. tyrrellii* Raup, and incorrectly aligned with *S. glauca* before being correctly recognized as *S. planifolia.* In addition to having aments borne on long, leafy spur shoots, plants that flower twice in the same year also tend to have more prominent stipules—possibly a reflection of their vigorous growth. During field work in Arizona in 1986 I found a specimen of *S. scouleriana* exhibiting second flowering and very vigorous growth (*Argus and Argus 12383* CAN), so the condition displayed by the type of *S. wendtii* was familiar to me.

The Mexican specimens of *S. scouleriana* tend to differ from northern specimens in having more villous or shaggy branchlets. The species usually has short, velutinous hairs on young branchlets, but some variation in branchlet indumentum does occur in the species. It is not surprising, in any case, that these isolated, disjunct

populations in the Southwest diverge somewhat from the main species populations.

Salix scouleriana occurs in western boreal North America (Little 1976, map 179) from Alaska eastward to Manitoba and southward in the cordillera to southern California, Arizona, and New Mexico. The Mexican specimens of *S. scouleriana* known so far are all from Coahuila, two from Sierra Maderas del Carmen, Mpio. de Ocampo and two from Sierra de la Madera, Cañon de Agua.

The habitat of *S. scouleriana* in the southwestern United States, where it usually occurs as scattered individuals, is in mixed conifer forests on steep, relatively dry slopes at elevations of 2350 to 3000 m.

Salix scouleriana in Mexico is similar morphologically and ecologically to the populations of the species in adjacent New Mexico and Arizona. Its Mexican occurrence is significantly disjunct from known localities in northern Arizona and New Mexico, but not unexpected. A thorough field study of Mexican *Salix* could be expected to extend the range of this boreal-cordilleran species even further and perhaps even to find other species of northern affinities.

Acknowledgments

I thank Kathleen Pryer for critically reading the manuscript. The Spanish abstract was prepared by Raul Cano.

Literature Cited

Argus, G. W. 1973. The genus *Salix* in Alaska and the Yukon. Natl. Mus. Nat. Sci., Publ. in Botany 2. 279 pp.

———. 1979. A reevaluation of the taxonomy of *Salix tyrrellii*, a sand dune endemic. Systematic Botany 4:163–177.

Espinosa de G. Rul, J. 1979. Salicaceae. Flora fanerogámica del Valle de México 1:95–99.

Johnston, I. M. 1944. Plants of Coahuila, eastern Chihuahua, and adjoining Zacatecas and Durango, IV. J. Arnold Arbor. 25:431–434.

Johnston, M. C. 1981. The diandrous, hypostomatous willows (Salicaceae) of the Chihuahuan Desert Region. Madroño 28:148–158.

Little, E. L., Jr. 1976. Atlas of United States trees. Vol. 3. Minor western hardwoods. U.S. Dept. Agric., Forest Serv., Misc. Publ. 1314.

Nee, M. 1984. Salicaceae. Flora de Veracruz. Fasc. 34. Instituto Nacional de Investigaciones sobre Recursos Bioticos. Xalapa, Ver. 24 pp.

Standley, P. C. 1920. *Salix. In* Trees and shrubs of Mexico. Contr. U.S. Natl. Herb. 23:160–163.

(Received 2 Dec 1987; revision accepted 22 Jun 1988.)